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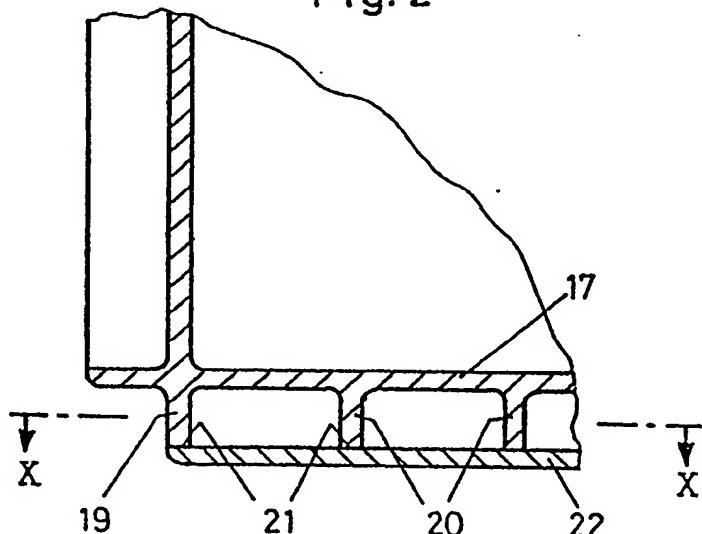
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(54) Storage and transporting container of plastics

(57) A container having four side walls and a base wall (17) is provided with reinforcement ribs (20) which are integrally formed in one piece on the base wall (17) and generally have the same height. A covering base wall (22) is connected to the edges (21), for example by vibration welding. Thus, the cavities between the reinforcement ribs (20) are closed off and all the external surfaces are flat and can be cleaned unproblematically. Alternatively, the container may have an integral bottom wall with upstanding ribs and a separate internal covering wall or members having upstanding ribs may be attached below the bottom wall of the container.

Fig. 2



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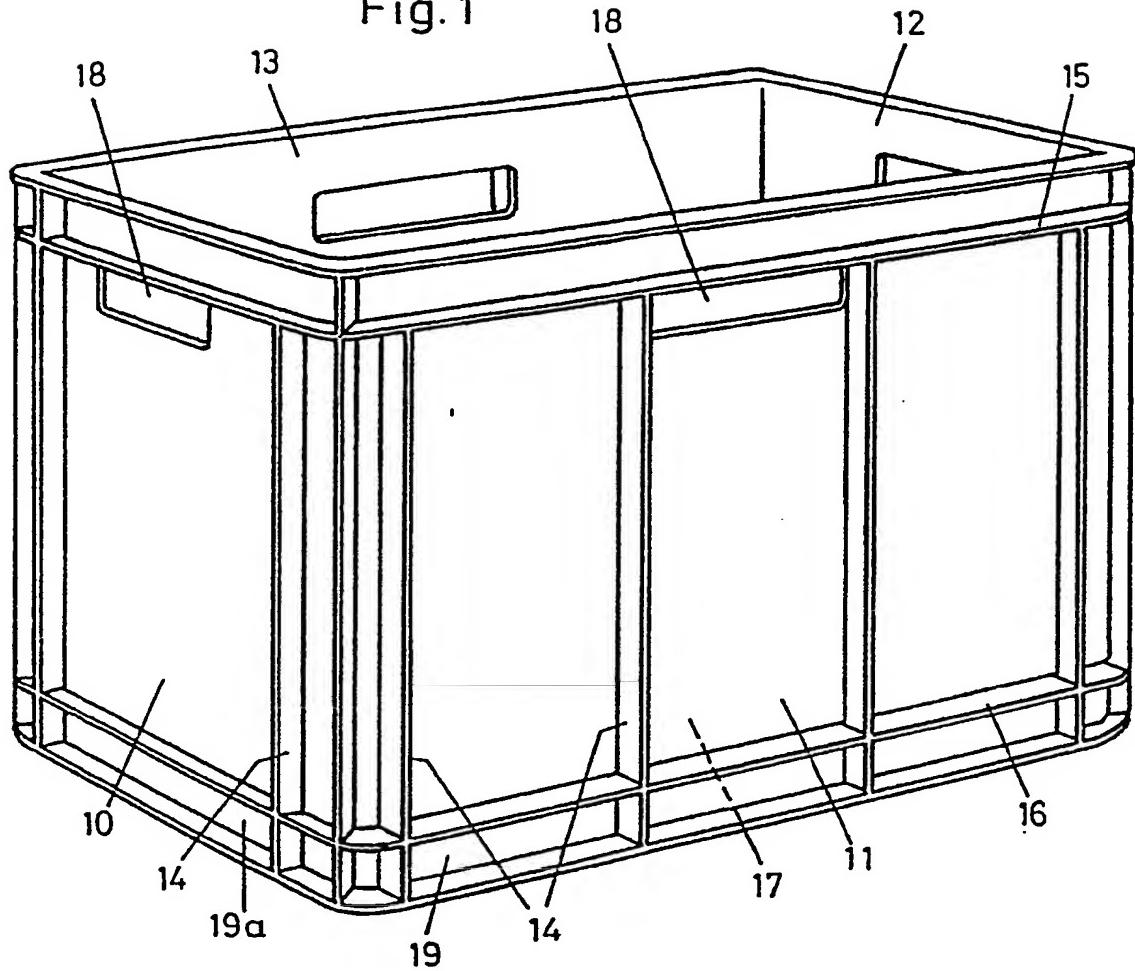
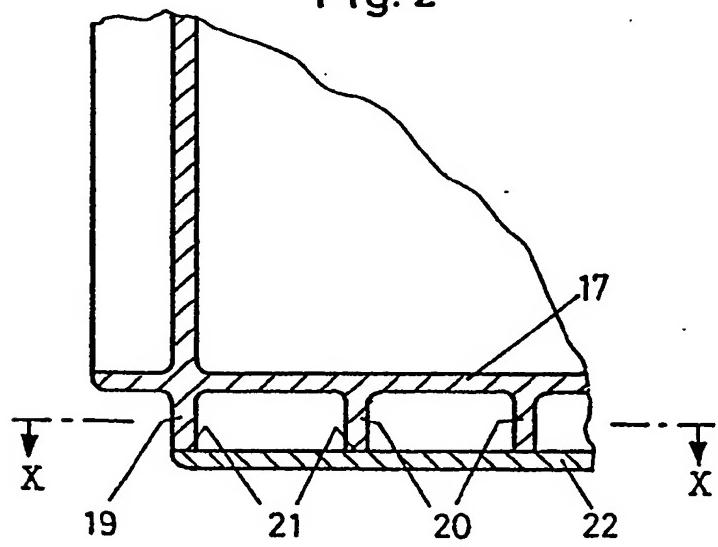


Fig. 2



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Fig. 3a

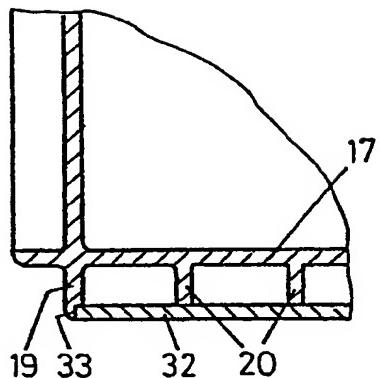


Fig. 3b

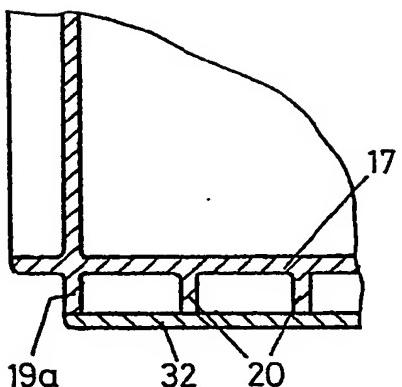


Fig. 4

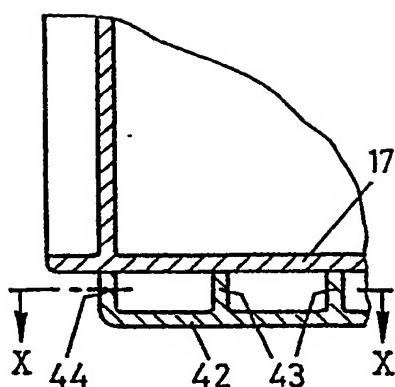


Fig. 5

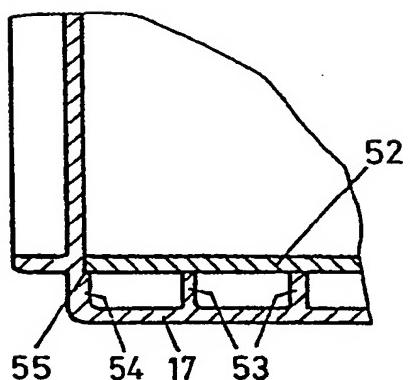


Fig. 6

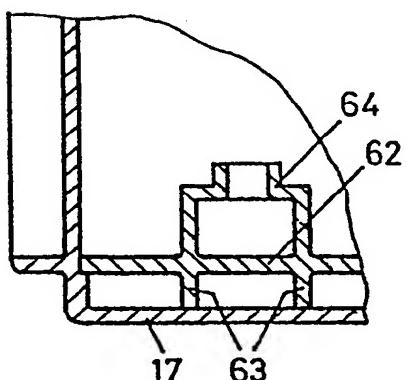


Fig. 7

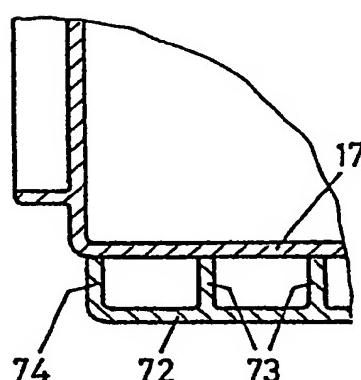


Fig. 8

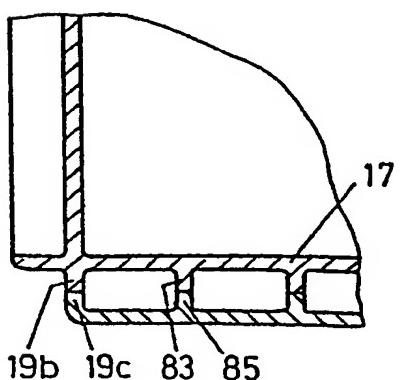


Fig. 9

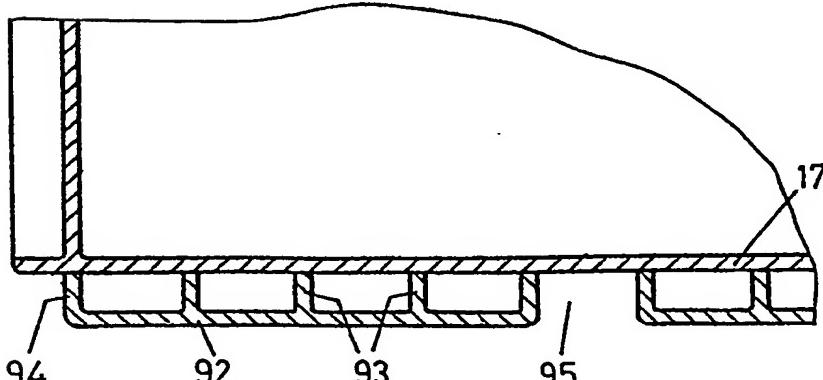


Fig. 10 3/3

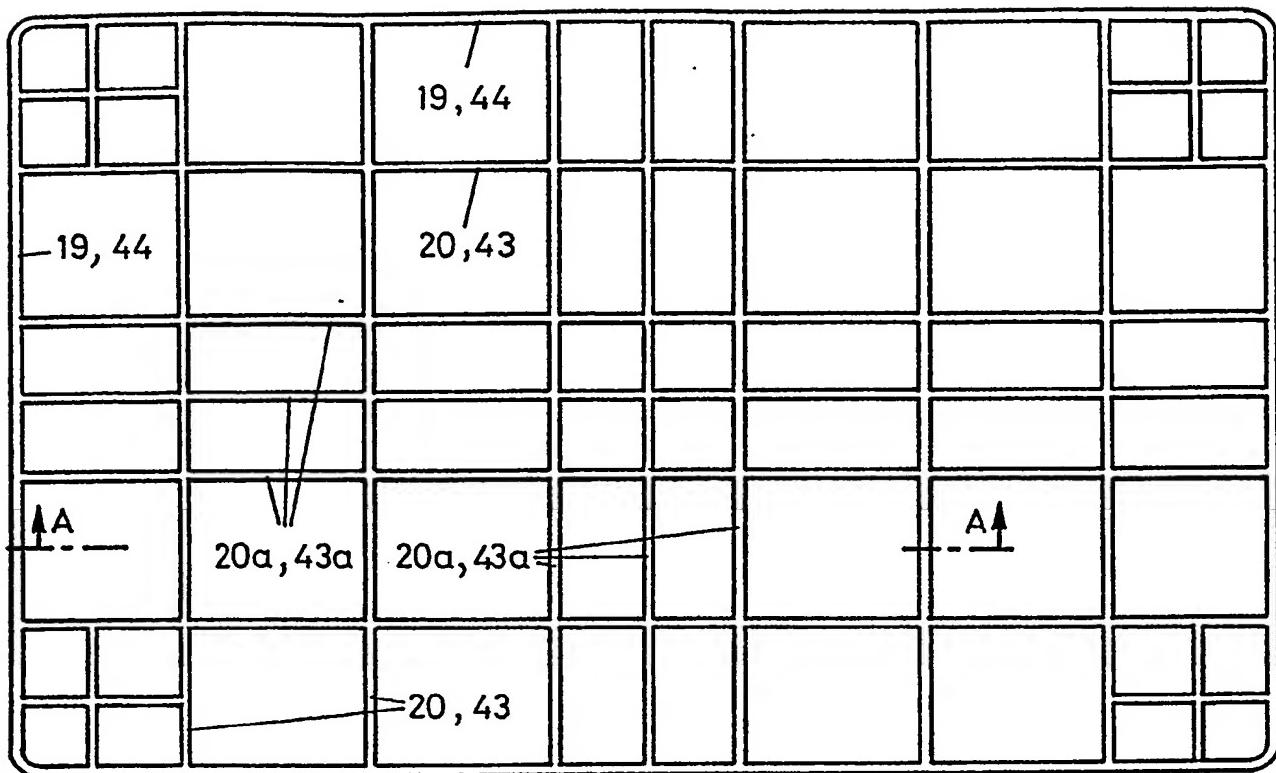


Fig. 11

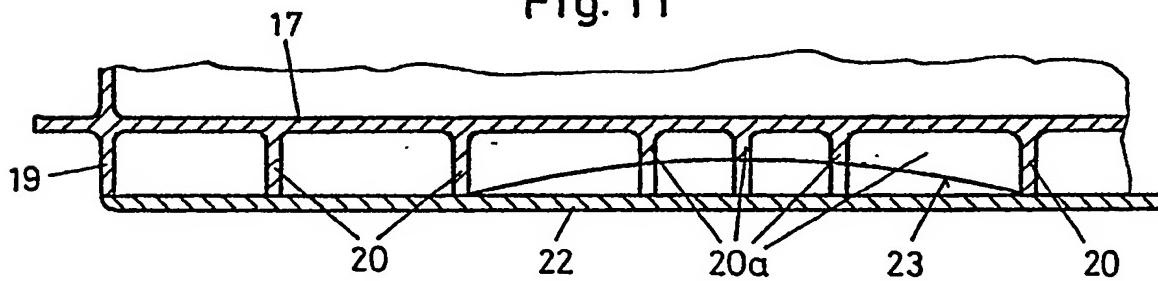
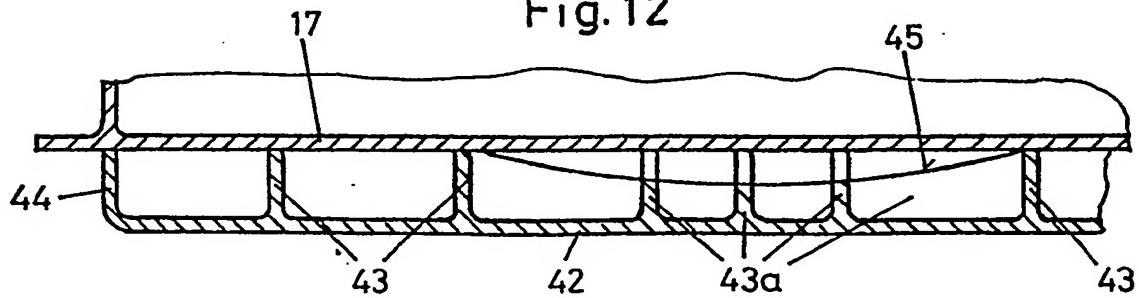


Fig. 12



Storage and transporting container of plastics

The present invention relates to a storage and transporting container having a base wall and four rigid side walls.

Containers of this type have been known for years and have been brought onto the market for example by the Applicant under the title RAKO System. The advantage of these storage and transporting containers resides in the fact that on the one hand they are easy to handle, have rigid walls and may be stacked in different sizes by dividing them in ratios matched to one another.

In the case of handling by means of machines and in the case of transporting on roller surfaces, roll tracks or conveyor belts, used with increasing importance nowadays, it has proved to be disadvantageous that the base bulges out under the effect of relatively heavy loads and can even develop a permanent buckling. They are thus no longer suitable or are only suitable to a limited extent for mechanical handling.

A solution to this problem is to be found by reinforcing the base in an appropriate manner. This has already been attempted in that the base wall was provided on the inside or outside with a waffle-type structure formed by mutually intersecting ribs. However, inside ribs reduce the space and outside ribs pose a resistance to translational displacement transport in that the container does not lie flat.

The German Utility Model G 89 03 430 and the German Patent Application 39 09 022 illustrate such a container having on the outside on the base wall a peripheral bottom rail or a base undersurface formed from bottom rail pieces. The container base wall can thus be reinforced by ribs and the bottom rails projecting over the ribs then serve as the transporting surface. Such a base has disadvantages in that inaccessible angular and corner areas are formed which can only be cleaned with difficulty.

It is therefore an object of the invention, in the case of a container of this type, to reinforce the base wall such that

no angular or corner areas which are inaccessible or are difficult to access are produced.

This is achieved by the container of Claim 1.

Examples of the invention and of the prior art are described below with reference to the drawings, in which:

Fig. 1 shows a perspective view of a known storage and transporting container,

Figs. 2 to 9 show part sectional views of a side wall area and a base wall area of different embodiments of the invention,

Fig. 10 shows a cross-section along the line X-X in Fig. 2 and Fig. 4, and

Figs. 11 and 12 show cross-sections along the line A-A in Fig. 10.

The container according to Fig. 1 comprises four side walls 10, 11, 12, 13, each having vertically arranged reinforcement ribs 14 and each having a horizontal peripheral reinforcement rib 15, 16, which are arranged at the top in the open part and at the bottom approximately at the height of the base 17. Handle cutouts 18 in each side wall 10, 11, 12, 13 are located below the peripheral reinforcement rib 15 and in each case between two vertical reinforcement ribs 14 in the longer side walls 11, 13.

Figure 2 shows the improvement according to an embodiment of the invention whereby, to reinforce the base wall 17, reinforcement ribs 20 are integrally formed on the base wall 17 and have the same height, as measured from the outer surface of the base wall 17, as the peripheral frame 19 of the side walls 10, 11, 12, 13. On the edges 21 of the reinforcement ribs 20 a covering base wall 22 is connected in one piece with these reinforcement ribs 20 and the frames 19. This connection can be made by vibration welding in that the covering base wall 22 is vibrated relative to the container. This could be carried out, for example after the container has been removed from the mould, in an additional, automated procedure synchronized with the mould movement. Other possibilities for one-piece connection are flush welding or even gluing.

As a result of the covering base wall 22, the hollow

spaces of the ribbing are completely closed off to the outside, so that the container is easy to clean. Moreover, as a result of the covering base wall 22 the flexural strength of the base is increased considerably, so that the container is also suitable for receiving relatively heavy loads. Because all the edges of the ribs 20, the frame 19 and the covering base wall 22 are supported, the risk of breakage in the event of concentrated external load, for example in the event of an impact, is low.

Figs. 3a and 3b show in principle the same arrangements as Fig. 2. In Figure 3a the covering base wall 32 is inserted in a step 33 in the longitudinal-side frame 19 and thus no join can be seen from the outside; in Figure 3b the covering base wall 32 extends across the narrow-side frame 19a. This is necessary for example in vibration welding for the relative movement.

In Fig. 4, the covering base wall 42 is provided with ribs 43 and frames 44 and can thus be placed on a flat outer surface of the base wall 17 and be connected thereto.

Fig. 5 shows an embodiment in which the reinforcement ribs 53 and the frames 54 are constructed as parts of the base wall 17 and the covering base wall 52 bears, on the inside of the container, on a peripheral shoulder 55. Here too, there must of course be space for vibrational movement, so that the covering base wall 52 should have at least along one edge a gap with respect to the side wall.

In analogous manner to Fig. 5, a covering base wall 62 is also to be found on the inside of the container in Fig. 6. In contrast to the embodiment described above, the reinforcement ribs 63 are now mounted on the covering base wall 62. 64 designates an integral forming on the covering base wall 62, that is to say a mounting for any kind of objects, such as for example workpieces or the like. This could be provided in any embodiment.

Fig. 7 is analogous to Fig. 4 described above, but here the base wall 17 is arranged to be more deeply set relative to the external flange by the amount of the depth of the frame 19,

and the covering base wall 72 having the reinforcement ribs 73 and a frame 74 are also located under the more deeply set base wall 17. The total height of the container is thus increased.

Fig. 8 shows a possibility according to which reinforcement ribs and frames are in two parts 83, 85 and 19b, 19c, the join occurring midway between the main and covering base walls, so that after welding of same a similar embodiment to the one according to Fig. 2 or 3 is obtained.

The covering base wall 92 having integrally formed thereon reinforcement ribs 93 and frames 94 can also be interrupted, so that between two adjacent parts of the covering base wall 92 a spacing 95 of approximately twice the width of the edge flange of the container is produced, so that it is possible to place containers of different sizes on top of one another, the spaces 95 receiving the top edges of the smaller containers.

Free channels as through passages could also be moulded between two adjacent reinforcement ribs in order to receive the prongs of fork lift trucks or the like.

Fig. 10 illustrates a section through the base ribs of a variant of Figs. 2 and 4. Between the peripheral frame 19, 44 there extend five continuous longitudinal and seven continuous transverse ribs 20, 43. In each case the central three ribs 20a, 43a have an arcuate cutout 23, 45 (Figs. 11 and 12) in the central region and are not welded in this region to the covering base wall 22 or the base wall 17. As a result of this construction it is achieved that in the event of a plastic deformation of the base wall 17 as the result of a heavy, central load the covering base wall 22, 42 stays flat and the container remains suitable for mechanical handling in spite of this deformation. Moreover, this construction has the advantage that the load is distributed over the periphery of the covering base wall.

In Fig. 10, the longitudinal and transverse ribs 20, 43 are arranged symmetrically with respect to the centre plane concerned. However, the construction according to the invention also permits an asymmetrical arrangement, for example if the container is constructed for receiving a certain

workpiece in a defined position (see Fig. 6). In such cases, it is advantageous to adapt the ribs 20, 43 to the position at which the force is introduced by the load and therefore possibly to arrange them in asymmetrical manner. Covering with the covering base wall 22, 32, 42, 52, 62, 72, 92 means that the asymmetrical ribs are not visible and cause no impedance to the conveying system.

Claims

1. Storage and transporting container of plastics, having a base wall and four side walls enclosing the latter, a covering base wall spaced from the base wall forming a cavity therebetween and reinforcement ribs in said cavity, the covering base wall covering the said reinforcement ribs.
2. A container according to Claim 1 wherein the base wall, reinforcement ribs and covering base wall are formed integrally.
3. A container according to Claim 2 wherein the reinforcement ribs are integrally formed on the outside of the base wall and the covering base wall is connected in one piece to the reinforcement ribs by vibration welding.
4. A container according to Claim 2 wherein the reinforcement ribs project from the base wall inwardly into said cavity and are covered by the covering base wall which bears on the inside on the reinforcement ribs and is connected in one piece thereto and to the side walls.
5. A container according to Claim 2 wherein the reinforcement ribs are integrally formed on the covering base wall and this covering base wall reinforced thus is connected in one piece with the base wall of the container.
6. A container according to one of Claims 1 to 5 wherein the reinforcement ribs are arranged as a grid.
7. A container according to one of Claims 1 to 6 wherein the reinforcement ribs and the covering base wall are arranged to form groove-like channels dividing said cavity into discrete portions.
8. A container according to Claim 6 wherein in a central

region the reinforcement ribs have an arcuate cutout to allow deflection of one base wall towards the other at said central region.

9. A storage and transporting container of plastics as claimed in Claim 1 substantially as herein described with reference to the accompanying drawings.

Patents Act 1977

Examiner's report to the Comptroller under
Section 17 (The Search Report)

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Relevant Technical fields

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(ii) Int CL (Edition 5) B65D 1/42, B65D 1/44, B65D 1/46

Search Examiner

MIKE HENDERSON

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

16 JULY 1992

Documents considered relevant following a search in respect of claims

1-9

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 943947 (MAUSER ET AL) (Flap 5 and 6 particularly relevant)	1,2,6,7
X	EP 0069419 A1 (WAVIN B V) (Whole specification relevant)	1,2

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

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